IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Gadi Lenz, *et al.*
Serial No.:	09/493,710
Filed:	January 28, 2000
Title:	SYSTEM COMPRISING A SINGLE-STAGE ALL-PASS OPTICAL FILTER
Grp./A.U.:	2633
Examiner:	Bello, Agustin

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING
I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA 22313, on:

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Sir:

DECLARATION OF CHRISTI K. MADSEN

The undersigned, Christi K. Madsen, a United States citizen residing at 8673 Wheelock Hall Rd., Hearne, Texas 77859, declares:

1. I attended and graduated from Rutgers University in 1996 with a Ph.D. degree in Electrical Engineering.

2. I am presently on the faculty of Texas A & M University, where for approximately six months I have been a professor of electrical engineering, engaged in development and research in the areas of photonic signal processing and integrated optics. Prior to joining the faculty at Texas

A & M University, I was employed by Bell Laboratories, Lucent Technologies, Inc. for 18 years in the same technical area.

3. I am presently a senior member of the IEEE, and a fellow of the Optical Society of America. I lecture frequently at national and international venues on the subject of optical processing using optical filters.

4. I am named as an inventor on seventeen issued U.S. patents in the areas of optical communications systems and filters.

5. I am an inventor in the present application and have read and understood the Examiner's Action dated December 20, 2004 on the present application and the references cited therein.

6. I have read and understand Harvey, *et al.*, Optics Letters, Vol. 18, No. 2, Jan. 15, 1993, pp. 107-109. In my opinion, Harvey does not disclose creating a plurality of time delay periods that are synchronized with the repetition rate of an input pulse train. Harvey discloses a feedback system to stabilize the output of a ring laser by actively controlling the ring length. Harvey employs a transmissive Fabry-Perot (FP) filter, which is commonly used to filter the amplitude of an optical signal, to derive an error signal to drive the feedback system. Generation of this error signal fundamentally depends on the amplitude filtering characteristics of the FP. Because Harvey specifically uses the amplitude peaks of the FP to generate the error signal, and because Harvey does not rely on, nor discuss time delay properties of an FP, I conclude that Harvey does not disclose creating a plurality of time delay periods that are synchronized with the repetition rate of an input pulse.

7. It is my expert opinion that Fig. 2 of Harvey shows a spectrum of transmission intensity peaks, not time delay peaks. The FP employed by Harvey is a transducer to produce a

significant change of light intensity output for a small change of ring-mode frequency. This mode of operation requires the spectrum of transmission intensity peaks produced by the FP.

8. A transmissive FP is not an All Pass Filter (APF), because a transmissive FP applies an intensity peak spectrum to an optical signal, while an APF passes the optical signal without substantially changing its intensity. While a reflective FP can be an APF, a reflective FP would frustrate Harvey's purpose. A reflective FP would act as a beam stop in Harvey's ring laser, and thus, without additional components, would render Harvey's ring laser inoperable. Even with such additional components, a reflective FP would not produce the amplitude filtering on which Harvey's frequency stabilization scheme depends.

9. Harvey does not disclose a method of generating a tunable delay for an optical signal using a single-stage APF. As discussed above, the FP filter used by Harvey is not an APF. Furthermore, as also discussed above, if the filter used by Harvey were an APF, then Harvey's ring laser would be inoperable without additional components. Even with such additional components, an APF would not provide the amplitude filtering necessary to generate an error signal. Finally, though an FP does induce a frequency-dependent time delay to an optical signal, spectral components not at the transmission peak of the filter are attenuated, making the FP unsuitable for generating a tunable time delay.

10. I have read and understand U.S. Patent 6,289,151 to Kazarinov, *et al.* Kazarinov describes the use of APFs with modulated laser pulse trains in optical communications systems. However, the APF described in the Application is particularly useful with an *unmodulated* pulse train, the subject of which Kazarinov does not address. In contrast, Harvey does address unmodulated pulse trains. But for the reasons discussed above, one of ordinary skill in the art would not choose a transmissive FP to induce a time delay on a signal. Moreover, the amplitude filtering

delay is needed. For example, a transmissive FP would be unsuitable to correct for linear chirp in a system using a pulsed laser signal, because signal components not aligned with the dday maximum of the transmissive FP would be attenuated instead of being merely delayed to recombine their energy with the pulse.

11. The undersigned declares further that all statements made herein of her own knowledge are true, and all statements made on information are believed to be true; and furthermore, that the statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title XVIII of the United States Code and that such willful, false statements may jeopardize the validity of the application or any patent issuing thereon.

Executed this 16 day of May, 2005 at College Station, Texas.

Christi K. Madsen